

## 4.0 CORRECTIVE ACTION FOR SOLID WASTE MANAGEMENT UNITS

The information provided in this section is submitted to address the applicable solid waste management unit (SWMU) requirements of the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20.4.1 NMAC), Subpart IX, 270.14(d), revised June 14, 2000 [6-14-00]. This section provides descriptions of the SWMUs that have been identified at Technical Area (TA) 50. Information for these SWMUs was extracted from the "RFI Work Plan for Operable Unit 1147" (LANL, 1992) and the "TA-50 Solid Waste Management Unit Report", hereinafter referred to as the TA-50 SWMU Report (LANL, 2002b). The TA-50 SWMU Report is provided as Supplement 4-1.

Los Alamos National Laboratory (LANL) uses the definition of a SWMU as presented in the U.S. Environmental Protection Agency (EPA) "Module VIII: Special Conditions Pursuant to the 1984 Hazardous and Solid Waste Amendments to Resource Conservation and Recovery Act (RCRA) for LANL, EPA I.D. NM0890010515" (EPA, 1994), hereinafter referred to as Module VIII. This definition states that a SWMU is "any discernible unit at which solid wastes have been placed at any time, irrespective of whether the unit was intended for the management of solid or hazardous waste. Such units include any area at or around a facility at which solid wastes have been routinely and systematically released."

### 4.1 SWMU DESCRIPTIONS [20.4.1 NMAC, Subpart IX, 270.14(d)(1)]

Several types of SWMUs are present at TA-50. These SWMUs include those identified for corrective actions in Module VIII, as modified following a Class III permit modification effective May 19, 1994; SWMUs that are active RCRA units; and SWMUs identified in the TA-50 SWMU Report. Brief unit and waste descriptions are provided in Tables 4-1 and 4-2. Figure 4-1 shows the locations of the SWMUs in TA-50.

#### 4.1.1 SWMUs Identified for Corrective Action In Module VIII

##### 4.1.1.1 Radioactive Liquid Waste Treatment Facility

SWMU No. 50-001(a) is identified as the Radioactive Liquid Waste Treatment Facility (RLWTF) and is located at TA-50, Building 1. The RLWTF is used to treat radioactive liquid waste (RLW) received from various TA's at LANL. The facilities at TA-50-1 consist of approximately 37,000-square feet of treatment equipment designed to remove radionuclides from RLW using neutralization, flocculation, clarification, and membrane filtration. After treatment the effluent from the RLWTF is monitored and discharged to a National Pollutant Discharge Elimination System (NPDES)-permitted Outfall 051 in Mortandad Canyon. Treatment sludges are stabilized and managed at TA-54.

#### 4.1.1.2 Waste Lines and Manholes

SWMU No. 50-001(b) consists of the active underground drain line system through which RLW is transferred from the various TA's to the RLWTF. A manhole (TA-50-72) serves as the central collection area for most of the incoming RLW. There are three lines that feed into this manhole. The primary waste line for LANL was replaced in 1982 with a double contained polyethylene pipe and enters the manhole from the north side of Pecos Drive. The second line transfers low-level RLW from TA-50-73, which receives waste from TA-50-69 and TA-50-37 operations. This line consists of a 6-inch (in.) by 10-in. double contained polyethylene pipe that has leak monitor and vacuum testing capabilities. The third line transports low-level RLW from TA-55 to TA-50-72 through manholes TA-50-016 and TA-50-78. This line consists of an inner stainless steel pipe encased in a polyvinyl chloride (PVC) pipe and has leak-monitor and vacuum test capabilities. This SWMU also consists of the drain lines from TA-50-72 to the RLWTF and from TA-55 to the underground storage tanks at TA-55-66.

#### 4.1.1.3 Underground Tanks

SWMU No. 50-002(a) consists of an underground, reinforced-concrete tank vault at TA-50, Building 2 that houses six flow-through process tanks, an equipment room, and waste-transfer lines associated with a RLWTF. The floor of the vault is 17 feet (ft) below ground and includes two raw-waste tanks (25,000 gallon [gal.] and 75,000 gal.), one low-level sludge tank (25, 000 gal.), and two effluent tanks (25,000 gal. each) for treated waste. The waste transfer lines include:

- Six cast-iron lines connecting TA-50-1 to the equipment room.
- Four steel lines added in 1984 to connect Room 61 to the Equipment room.
- Five cast iron lines from drains in TA-50-1 to the decontamination and decommissioning (D&D) tank in TA-50-2.
- One cast iron line from a sink in the vehicle decontamination facility to the D&D effluent line connecting 50-90 to one of the influent tanks.

#### 4.1.1.4 Vaulted Underground Tanks for TA-50 Waste

SWMU No. 50-002(b)-00 is a consolidated SWMU that consists of former SWMU's 50-002(b) and (c). This SWMU includes two active waste tanks (TA-50-67 and TA-50-68) and their associated inlet and outlet lines housed in an underground vault (TA-50-66). The concrete vault measures 18-ft long, 16-ft wide, by 14 ft deep and is located approximately 30-ft west of the southwest corner of TA-50-1. The inlet lines consist of four stainless steel pipes encased in PVC. One of these lines is capped and serves as a backup. The second pipe transfers acidic RLW and the third transfers caustic RLW. The waste is transferred from the storage tanks through two double contained stainless steel lines to Room 60 at TA-50-1 for treatment. The tanks, piping, and vault were constructed exclusively to transfer/store caustic and acidic RLW received from TA-55.

#### 4.1.1.5 Aboveground Storage Tank

SWMU No. 50-002(d) consists of a decommissioned aboveground storage tank (TA-50-5) that is located adjacent to the north wall of Room 60D at TA-50-1. The tank has a capacity of 5,000-gal. and was used to store nitric acid intended to recharge ion-exchange columns at the RLWTF. It was used to store nitric acid product only and was never used to store waste.

#### 4.1.1.6 Container Storage Units

SWMU No. 50-003(a) and 50-007 consist of two CSUs that were used for hazardous and mixed waste storage and are scheduled for closure. SWMU No. 50-003(a) is located at the northwest corner of TA-50-1, Room 59. This CSU is used to store containers of cemented mixed waste sludge and is approximately 10 ft wide by 19 ft long. SWMU No. 50-007 is located at TA-50-37 and contains a CSU that includes Rooms 115, 117, and 118. Room 115 is located on the first floor of TA-50-37 and measures 10-ft wide by 21-ft long. Room 117 is located on the first floor in the eastern portion of TA-50-37 and measures 21-ft wide and 40-ft long. Room 118 is located on the first floor in the eastern portion of TA-50-37 and measures 31-ft wide and 40-ft long.

SWMU No. 50-008 consists of an active Indoor CSU located at TA-50, Building 69. The CSU consist of Rooms 102 and 103 and is used for hazardous and mixed waste storage. Room 102 is referred to as the main process room and is approximately 45-ft wide by 52-ft long. Room 103 is referred to as the unloading area and is approximately 18 ft wide by 19 ft long.

#### 4.1.1.7 Historical Waste Lines and Underground Vault, RLWTF

The consolidated SWMU No. 50-004(a)-00 consists of former SWMU's 50-004(a), 50-004(b), and 50-004(c) and includes all historical waste lines and former components of the RLWTF at TA-50-1.

This includes:

- Locations through which underground RLW and industrial waste lines were routed to the RLWTF from the LANL technical areas located along Pajarito Road.
- A decommissioned underground vault (TA-50-3) that housed three-stainless-steel lined concrete storage tanks, ranging in volume from 1,000 to 4,500 gal. and used to collect and store wastewater from the Omega reactor.
- Waste lines and manholes to the collection tank structure (TA-50-3) including waste line 49 from TA-35 and waste line 50 from TA-50-1.
- Thirteen industrial waste lines (44, 45, 45a, 46, 47, 48, 48a, 49, 54, 55, 56, 65, and 67) and three associated manholes (TA-50-6, 55, and 56) that discharged to the decommissioned underground vault.

#### 4.1.1.8 Operational Releases/Outfalls

SWMU Nos. 50-006 (a, c, and d) consist of operational releases and outfalls located at TA-50. A portion of Upper Ten Site Canyon received two accidental releases of RLW as a result of a sump overflow at TA-50-2. This site is identified as SWMU No. 50-006(a). Airborne releases via stack emissions from the RLWTF and other treatment facilities at TA-50 have contaminated some soil in the area and are identified as SWMU No. 50-006(c). SWMU No. 50-006(d) consists of the RLWTF treated liquid effluent discharged into Mortandad Canyon. This active effluent discharge is subject to regulation under the Clean Water Act (CWA) and is permitted as NPDES Outfall 051. Parameters prescribed by the NPDES permit are sampled in accordance with that permit's requirements.

#### 4.1.1.9 Incinerator

An incinerator complex was housed in TA-50-37 and is identified as SWMU No. 50-007. The incinerator complex was comprised of the incinerator, various waste-feed components, and two waste-feed tanks located in Rooms 112 and 115. The unit was used to treat solid and liquid wastes containing chlorinated and fluorinated hydrocarbons, carcinogenic materials, and TRU wastes. The incinerator unit, storage tanks, and associated CSU have undergone closure (Benchmark, 1998).

#### 4.1.1.10 Material Disposal Area

Material Disposal Area (MDA) C is identified as SWMU No. 50-009 and consists of an 11.8-acre disposal site that comprises approximately one-half of TA-50. MDA C includes six pits that were used for the disposal of radioactive and hazardous waste (Pits 1 through 6), one unnumbered pit for disposal of chemical wastes, 107 disposal shafts, and one unnumbered shaft that was used for a single disposal of strontium-90. Pits 1 through 4 measure approximately 610 ft long, 40 ft wide, and 25 ft deep. Pit 5 is approximately 705 ft long, 110 ft wide, and 18 ft deep. Pit 6 is approximately 505 ft long, 100 ft wide, and 25 ft deep. The chemical pit measures approximately 180 ft long, 25 ft wide, and 12 ft deep. The disposal shafts vary in depth and diameter. Table 4-1 lists the various types of waste that

were disposed of at MDA C. Waste disposal at MDA C ceased by 1969, and the MDA C was officially decommissioned in 1974.

#### 4.1.1.11 Decontamination Facility

SWMU No. 50-010 consists of an inactive vehicle decontamination area at TA-50-1, Room 34B, that is used to clean vehicles and radioactively contaminated large objects. The area was operated from 1963 through October 1999 and was enclosed in 1983. Liquid wastes generated during decontamination activities were transferred to TA-50-2 via the floor drain and waste line.

#### 4.1.1.12 Septic System and Lift Stations

SWMU No. 50-011(a) is the location of a decommissioned septic system that was installed in 1964 at the south end of the RLWTF at TA-50-1. This septic system was comprised of a septic tank (TA-50-10), a manhole (TA-50-9), a sanitary distribution box (TA-50-11), and a seepage pit. The septic system was removed in 1983 except for the perforated pipe, which made up the seepage pit. These areas are currently located beneath an asphalt pad and Building 83. The septic system managed sanitary waste only.

SWMU No. 50-011(b) is composed of two active sanitary wastewater lift stations (TA-50-91 and 92) and approximately 400 ft of piping that transports sanitary wastewater from the RLWTF to the main line that serves the Solid Waste Sanitary Control Plant. The lift stations are located on the north and south sides of TA-50-1 and were installed as part of a utility upgrade in 1983.

#### 4.1.2 SWMUs Not Identified for Corrective Action in Module VIII

##### 4.1.2.1 Container Storage Units

The TA-50-69, Outdoor CSU has not been formerly evaluated relative to its status as a SWMU nor is it assigned a SWMU number. This CSU is located in the southwest corner of TA-50 and consists of an asphalt pad that is not lined or coated. The CSU is used for hazardous and mixed waste storage and is approximately 24 ft wide by 90 ft long, with an additional strip that is 12 ft wide by 90 ft long added to the southeast end.

The TA-50-114 CSU is identified at SWMU No. 50-003(d) and consists of a storage locker located south of the eastern wing of TA-50-1 and east of TA-50-1 Room 34 B. This CSU was used to store waste generated at the RLWTF and consists of a metal prefabricated building approximately 9 ft by 23 ft by 9 ft high, has three doors, and is anchored to a concrete pad. The CSU is divided into two separate lockers by a metal wall, and has a grated floor above a recessed area on which the waste containers are placed.

#### 4.1.2.2 Batch Waste Treatment Unit

SWMU No. 50-005 consists of the Batch Waste Treatment Unit (BWTU) located in the basement of TA-50-1. The BWTU included a 500-gal. pressure vessel, filtering system, condenser, vacuum transfer lines, transfer pump, and associated transfer lines. The unit was permitted for hazardous waste treatment and closed in accordance with an NMED-approved closure plan (IT, 1994).

#### 4.2 RELEASES [20.4.1 NMAC, Subpart IX, 270.14(d)(2)]

Some of the SWMUs listed in Table 4-1 have released, or are suspected to have released, hazardous waste or hazardous constituents. In 1990, LANL initiated drilling activities to test the integrity of the waste tanks comprising SWMU Nos. 50-002(a) and (b)-00. Cuttings from the boreholes revealed that some of the soil appeared wet and, based on field screening, were found to be radioactively contaminated.

SWMU No. 50-004(a)-00, a waste line in the vicinity of TA-50-37, has leaked. Radioactively contaminated soil discovered during waste line decommissioning activities was cleaned up to levels as low as reasonably achievable. Potential chemical contaminants were not analyzed at the time of decommissioning.

Accidental releases from the RLWTF have contaminated sections of Upper Ten Site Canyon [SWMU No. 50-006(a)] with radioactive and chemical wastes. Airborne contaminants released through stack emissions from the RLWTF, and other treatment facilities at TA-50 have contaminated soil at various locations within TA-50 [SWMU No. 50-006(c)]. Liquid effluent from the treatment plant, released prior to the issuance of a NPDES permit, has contaminated sections of Mortandad Canyon with a variety of chemical, radiological, and heavy metal wastes [SWMU No. 50-006(d)]. This active effluent discharge is subject to regulation under the CWA. Parameters prescribed by the NPDES permit are sampled in accordance with that permit's requirements.

#### 4.3 CHARACTERIZATION OF RELEASES

Information regarding releases from SWMUs is contained in the "RFI Work Plan for Operable Unit 1147" (LANL, 1992). These descriptions include the material released and the nature of the release. However, because of the nature of the releases, the exact volume released is not always known. The timing of the releases can only be estimated by the period of operation and sampling events. Additional information on the SWMUs at TA-50 and any associated releases is provided in the revised TA-50 SWMU Report (LANL, 2002b) that is included as Supplement 4-1 of this permit renewal document.

4.4 CORRECTIVE ACTIONS [20.4.1 NMAC, Subpart V, 264.101(a)]

Pursuant to 20.4.1 NMAC, Subpart V, 264.101(a) [6-14-00], corrective actions are required for releases of hazardous waste or hazardous constituents. SWMUs identified in Section 4.1.1 and that are known or believed to have releases will be investigated in accordance with a schedule approved by NMED through LANL Environmental Restoration Project correction action activities. Corrective action, if necessary, will follow the RCRA Facility Investigation/Corrective Measures Study process.

**Table 4-1**

**Solid Waste Management Units (SWMU)  
Identified for Corrective Action in Module VIII <sup>a</sup>**

<b>SWMU No.</b>	<b>Unit Type</b>	<b>Unit Description</b>	<b>Waste Description</b>
50-001(a)	Radioactive Liquid Waste Treatment Facility (RLWTF)	The RLWTF is located at TA-50, Building 1 and designed to treat 250 gallons/minute of radioactive liquid waste (RLW) using neutralization, flocculation, clarification, and membrane filtration.	RLW, sludge, and potentially hazardous constituents
50-001(b)	Waste Lines and Manholes	Liquid waste transfer system.	RLW and potentially hazardous constituents
50-002(a)	Tank farm	A reinforced concrete vault that houses six flow-through process tanks, an equipment room, and associated waste transfer lines.	RLW, sludge, and potentially hazardous constituents
50-002(b)-00 <sup>b</sup>	Underground Storage Tanks	Two active waste tanks (TA-50-67 and TA-50-68) and their associated inlet and outlet lines housed in an underground vault located approximately 30 ft west of the southwest corner of TA-50-1.	RLW and potentially hazardous waste
50-002(d)	Aboveground Storage Tank	Decommissioned aboveground, 5000-gallon, stainless steel tank used for nitric acid storage.	Unused product storage only
50-003(a)	Container Storage Unit	An approximately 10- by 19-foot area located in TA-50-1, Room 59 along the northwest wall.	Mixed waste
50-004(a)-00 <sup>c</sup>	Historical Waste Lines and Underground Vault, RLWTF	<p>All former components of the RLWTF at TA-50-1. Includes:</p> <ul style="list-style-type: none"> <li>Decommissioned RLW and industrial waste lines routed to the RLWTF from LANL TAs located along Pajarito Road.</li> <li>Decommissioned underground concrete vault (TA-50-3) that housed three stainless-steel-lined concrete storage tanks (1,000 – 4,500 gallons) used to collect and store wastewater from the Omega Reactor.</li> <li>13 industrial waste lines that discharged to the decommissioned underground vault TA-50-3.</li> </ul>	RLW and potentially hazardous constituents



**Table 4-1 (continued)**

**Solid Waste Management Units (SWMU)  
Identified for Corrective Action in Module VIII <sup>a</sup>**

<b>SWMU No.</b>	<b>Unit Type</b>	<b>Unit Description</b>	<b>Waste Description</b>
50-006(a)	Operational Release	Outfall area at the head of Ten Site Canyon impacted by two accidental operational releases due to a sump overflow at the RLWTF pump house.	RLW and potentially hazardous constituents
50-006(c)	Operational Release	Surface Soil contamination from historical stack emissions from operations at TA-50.	Soil contaminated with radioactive and potentially hazardous constituents
50-006(d)	Effluent Discharge	Drainline and NPDES-permitted Outfall 051 in Mortandad for treated wastewater from the RLWTF.	Soil contaminated with a variety of chemicals, radionuclides, and heavy metals
50-007	Incinerator and Container Storage Unit	An incinerator, various waste feed components, two waste feed tanks  Container Storage Unit located in Rooms 115, 117, and 118 at TA-50-37.	Hazardous and mixed waste
50-008	Container Storage Unit	Container storage Unit located inside Rooms 102 and 103 at TA-50, Building 69 (TA-50-69).	Mixed waste
50-009	Material Disposal Area (MDA) C	An inactive MDA that covers 11.8-acres and consists of 7 pits and 108 shafts located on the north side of Pajarito Road at TA-50	Radioactive, mixed, hazardous, and solid waste
50-010	Decontamination Facility	An inactive vehicle decontamination area located in Room 34 B of the RLWTF at TA-50-1.	Radioactive and potentially hazardous waste
50-011(a)	Septic system	Decommissioned septic system located at the south end of the RLWTF at TA-50-1. The systems consisted of an influent line from TA-50-1, septic tank, manhole, a sanitary distribution system, and a seepage pit.	Sanitary waste

**Table 4-1 (continued)**

**Solid Waste Management Units (SWMU)  
Identified for Corrective Action in Module VIII <sup>a</sup>**

<b>SWMU No.</b>	<b>Unit Type</b>	<b>Unit Description</b>	<b>Waste Description</b>
50-011(b)	Lift Stations	Two active sanitary wastewater lift stations (TA-50-91 and TA-50-92) and approximately 400 feet of piping that transport sanitary wastewater from the RLWTF to the main line that serves the SWSC Plant.	Sanitary waste

- a Information compiled from the LANL, 2002b, "TA-50 SWMU Report," Los Alamos National Laboratory, Los Alamos, New Mexico; and LANL, 1992, "RFI Work Plan for Operable Unit 1147," Los Alamos National Laboratory, Los Alamos, New Mexico.
- b Consolidated SWMU that consists of former SWMUs 50-002(b) and 50-002(c).
- c Consolidated SWMU that consists of form SWMUs 50-004(a), 50-004(b), and 50-004(c).
- d TBD = SWMU Number to be determined.

**Table 4-2**

**Solid Waste Management Units (SWMU)  
Not Identified for Corrective Action in Module VIII <sup>a</sup>**

<b>SWMU No.</b>	<b>Unit Type</b>	<b>Unit Description</b>	<b>Waste Description</b>
50-003(d)	Container Storage Unit	An approximately 9 ft by 23 ft by a 9 ft high CSU located east of TA-50-1, Room 34B at TA-50, Building 114.	Hazardous and mixed waste
50-005	Batch Waste Treatment Unit	Closed 500-gallon pressure vessel and associated processing components located at TA-50-1.	Hazardous waste
TBD <sup>b</sup>	Container Storage Unit	An approximately 24 ft wide by 90 ft long asphalt and concrete pad with a 12 ft wide by 90 ft long strip located in the southwest corner of TA-50, located outside TA-50-69.	Mixed waste

a Information compiled from the LANL, 2002b, "TA-50 SWMU Report," Los Alamos National Laboratory, Los Alamos, New Mexico; LANL, 1992, "RFI Work Plan for Operable Unit 1147," Los Alamos National Laboratory, Los Alamos, New Mexico.

b TBD = SWMU Number to be determined.

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**Supplement 4-1**

**“TA-50 Solid Waste  
Management Unit Report,” Los Alamos  
National Laboratory, Los Alamos,  
New Mexico, April 2002.**